hp StorageWorks Interface Manager and Command View ESL

Installation Guide

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hp StorageWorks Interface Manager and Command View ESL

Product Version: 1

Second Edition (November 2003)

Part Number: 341430-002

This user guide provides instructions for the installation and use of the HP StorageWorks Interface Manager for ESL Tape Libraries. This guide also provides instruction for installing and configuring Command View ESL software.

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About This Guide

This user guide provides information to help you:

- Understand the functionality of the Interface Manager card
- Install the Interface Manager card
- Install and configure Command View ESL
- Configure and use the Interface Manager card

“About this Guide” topics include:

Overview

This section covers the following topics:

Intended Audience

This book is intended for use by system administrators and IT personnel responsible for operating and maintaining an HP StorageWorks ESL9000 Series Tape Library.

Related Documentation

In addition to this guide, HP provides corresponding information:

- *HP StorageWorks Interface Manager and Command View ESL User Guide*
- *HP StorageWorks Interface Manager and Command View ESL Installation Instructions*
- *HP StorageWorks ESL9000 Series Tape Library User Guide*

Conventions

Conventions consist of the following:

- Document Conventions
- Text Symbols
- Equipment Symbols

Document Conventions

The document conventions included in Table 1 apply in most cases.

Table 1: Document Conventions

Element	Convention
Cross-reference links	Figure 1
Key and field names, menu items, buttons, and dialog box titles	**Bold**
File names, application names, and text emphasis	*Italics*
User input, command and directory names, and system responses (output and messages)	`Monospace font` `COMMAND NAMES` are uppercase monospace font unless they are case sensitive
Variables	`<monospace, italic font>`
Website addresses	Underlined sans serif font text: http://www.hp.com

Text Symbols

The following symbols may be found in the text of this guide. They have the following meanings.

WARNING: Text set off in this manner indicates that failure to follow directions in the warning could result in bodily harm or death.

Caution: Text set off in this manner indicates that failure to follow directions could result in damage to equipment or data.

Note: Text set off in this manner presents commentary, sidelights, or interesting points of information.

Equipment Symbols

The following equipment symbols may be found on hardware for which this guide pertains. They have the following meanings.

Any enclosed surface or area of the equipment marked with these symbols indicates the presence of electrical shock hazards. Enclosed area contains no operator serviceable parts.

WARNING: To reduce the risk of personal injury from electrical shock hazards, do not open this enclosure.

Any RJ-45 receptacle marked with these symbols indicates a network interface connection.

WARNING: To reduce the risk of electrical shock, fire, or damage to the equipment, do not plug telephone or telecommunications connectors into this receptacle.

Any surface or area of the equipment marked with these symbols indicates the presence of a hot surface or hot component. Contact with this surface could result in injury.

WARNING: To reduce the risk of personal injury from a hot component, allow the surface to cool before touching.

Power supplies or systems marked with these symbols indicate the presence of multiple sources of power.

WARNING: To reduce the risk of personal injury from electrical shock, remove all power cords to completely disconnect power from the power supplies and systems.

Any product or assembly marked with these symbols indicates that the component exceeds the recommended weight for one individual to handle safely.

WARNING: To reduce the risk of personal injury or damage to the equipment, observe local occupational health and safety requirements and guidelines for manually handling material.

Getting Help

If you still have a question after reading this guide, contact an HP authorized service provider or access our website: http://www.hp.com.

HP Technical Support

Telephone numbers for worldwide technical support are listed on the following HP website: http://www.hp.com/support/. From this website, select the country of origin.

Note: For continuous quality improvement, calls may be recorded or monitored.

Be sure to have the following information available before calling:

- Technical support registration number (if applicable)
- Product serial numbers
- Product model names and numbers
- Applicable error messages
- Operating system type and revision level
- Detailed, specific questions

HP Storage Website

The HP website has the latest information on this product, as well as the latest drivers. Access storage at: http://www.hp.com/country/us/eng/prodserv/storage.html. From this website, select the appropriate product or solution.

HP Authorized Reseller

For the name of your nearest HP authorized reseller:

- In the United States, call 1-800-345-1518
- In Canada, call 1-800-263-5868
- Elsewhere, see the HP website for locations and telephone numbers: http://www.hp.com.

Introduction

1

Functional Overview

The HP StorageWorks Interface Manager for ESL tape libraries is a management card designed to consolidate and simplify the management of multiple HP StorageWorks e2400-160 Fibre Channel (FC) interface controllers—also known as FC-to-SCSI routers—installed in an HP StorageWorks ESL9000 Series Tape Library. The Interface Manager card provides the following features:

- Simple, unified, graphical setup and configuration of FC interface controllers
- Remote management of FC interface controllers via a web-based GUI or command line interface
- SAN-related diagnostics for key library components such as interface controllers, drives, and robotics
- Additional advanced SAN security and management features are available via licensing. These features improve security, performance, reliability, and ease of control. Advanced features include:
  - **HP StorageWorks Direct Backup Engine for ESL Tape Libraries**—This feature provides a direct or "serverless" backup solution that streams data directly from the HP disk array to a tape drive in the ESL Series library without sending data through an application server. The Interface Manager card is required to activate this feature.
  - **HP StorageWorks Secure Manager for ESL Tape Libraries**—This feature gives the ESL Series library administrator control over which libraries or drives within a library may be accessed by the various backup hosts on the SAN.

Architectural Concepts

The Interface Manager card and the FC interface controllers that it manages are installed in the expansion cage of the ESL Series library. The Interface Manager card has six Ethernet ports as follows:

- Four Ethernet ports communicate directly with the FC interface controllers over a private dedicated IP LAN.
- One Ethernet port connects to the LAN. The Interface Manager card communicates with the management station over the LAN. The management station is a Microsoft Windows-based PC (server) that hosts the Command View ESL software. Ideally, the management station should have a static IP address and be dedicated for use with the Interface Manager card and Command View ESL software.
- The remaining Ethernet port is reserved for future functionality.

Any client machine on the LAN can communicate with the Interface Manager card either through a rich GUI web interface, or through a Telnet command line interface (CLI).

In addition, the Interface Manager card also has an RS-232 port that provides the same CLI as the Telnet interface. Only one CLI interface can be active at a time. For more information on configuring and using the different management interfaces, see Configuration and Software Installation.

Figure 1 illustrates the high-level architecture of the Interface Manager card as it relates to other library components.

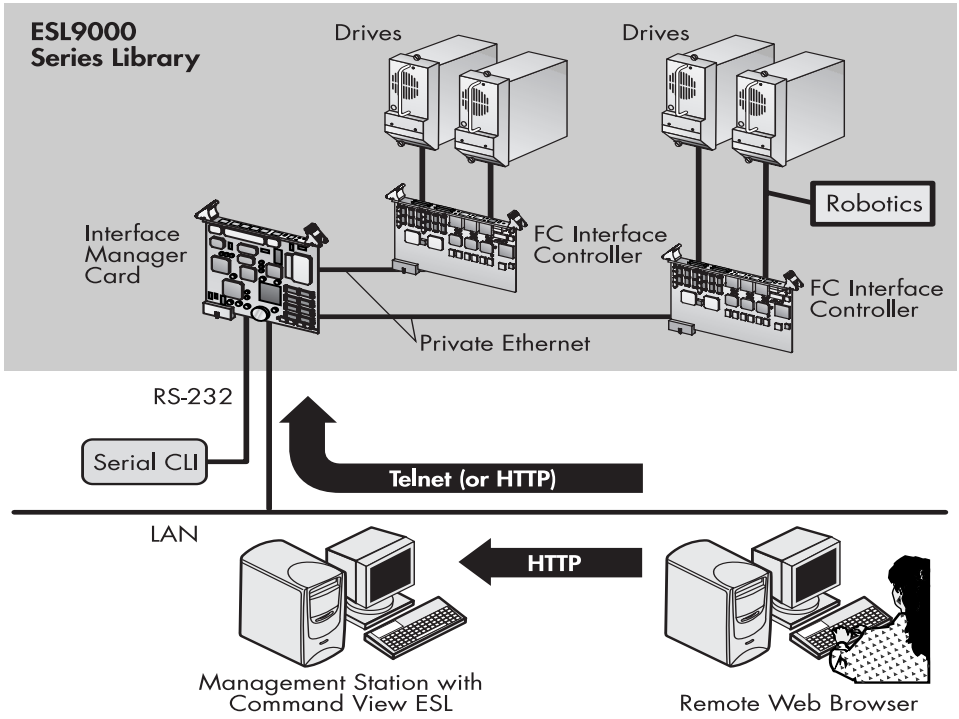


Figure 1: High-level architecture

At a higher level, multiple libraries, each containing an Interface Manager card, can be connected to a single management station. Each Interface Manager card can communicate with only one management station, but the management station can communicate with multiple Interface Manager cards. Figure 2 illustrates this concept.

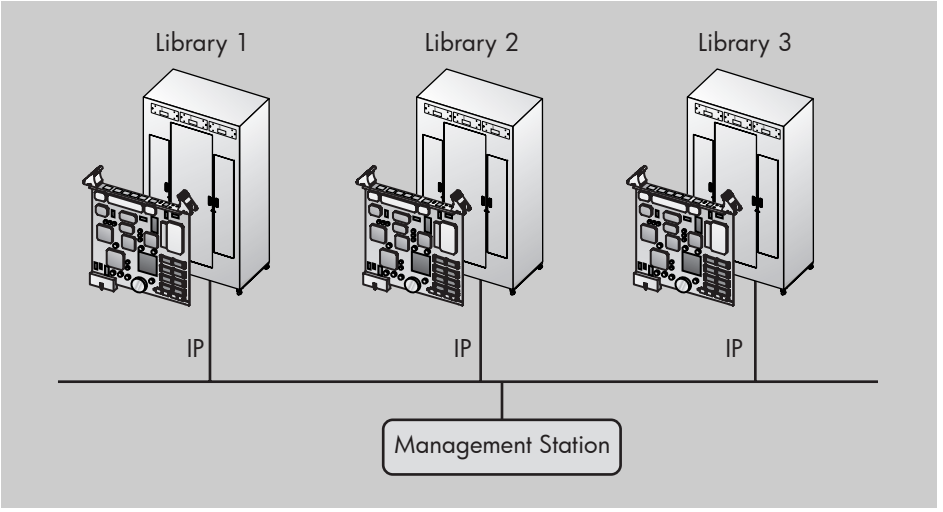


Figure 2: Multiple libraries connected to a single management station

Note: HP recommends that you install Command View ESL on a single server (management station) on the LAN. However, it is possible to install Command View ESL on multiple servers. In this scenario, if one management station "claims" a library for management, then that same library cannot be managed by any other management station. A library can only be managed by one management station at a time.

External Features Overview

Figure 3 and Table 2 identify the I/O components of the Interface Manager card:

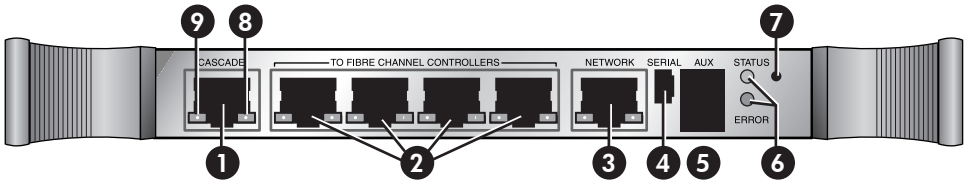


Figure 3: Interface Manager faceplate

Table 2: Interface Manager I/O components

Item	Description
❶	Cascade in back-end Ethernet port (reserved for future functionality)
❷	Private Ethernet ports to FC interface controllers
❸	Front-end Ethernet port (to LAN)
❹	Serial port
❺	Auxiliary RJ-11 serial connector (not used)
❻	Board status LEDs
❼	Reset button
❽	Green link speed LED
❾	Green link activity LED

Note: For an explanation of the various LED states, see Troubleshooting.

Prerequisites

Successful operation of the Interface Manager card requires the following:

- HP StorageWorks ESL9000 Series Tape Library with a minimum firmware revision of 3.40
- Interface Manager card and documentation
- ESL9000 Series library expansion cage and supplied installation hardware (ships with the Interface Manager card)
- One to four HP StorageWorks e2400-160 Fibre Channel interface controllers with a minimum firmware revision of 5.1.08
- Management station—a Microsoft® Windows®-based PC (server). Ideally, the management station should be dedicated for use with the Interface Manager card and have a static IP address.

Hardware Installation

2

This chapter explains the installation procedure for the expansion cage and the Interface Manager card. Two installation types are possible:

- First-Time Installation—The ESL9000 Series library expansion cage is installed into the library for the first time, and the Interface Manager card and Fibre Channel (FC) interface controllers are installed together into the expansion cage.
- Upgrade Installation—An Interface Manager card is added to a previously installed expansion cage containing one to four FC interface controllers.

This document presents the full installation procedure for a first-time installation. If you are performing an upgrade installation, you are informed which steps apply and which steps can be skipped.

Performing a first-time installation of the Interface Manager card requires several steps, which should be performed sequentially as follows:

- Preparing the Installation
- Installing the Expansion Cage in the ESL Series Library
- Installing the Fibre Channel Interface Controllers into the Expansion Cage
- Installing the Interface Manager Card into the Expansion Cage
- Connecting the Cables
- Completing the Hardware Installation

Note: If you are also installing one or more HP StorageWorks e2400-160 Fibre Channel Interface Controllers with the Interface Manager card, use this documentation instead of the installation instructions that come with the Fibre Channel interface controllers.

Preparing the Installation

- Required components and hardware:
  - ESL9000 Series library (with minimum firmware revision of 3.40)
  - ESL9000 Series library expansion cage with cooling fan (first-time installations only)
  - Interface Manager card
  - FC interface controllers (up to four per library)
  - Ethernet cable bundle—included with the Interface Manager card
  - RJ-45 Ethernet cable
  - Serial cable—included with the Interface Manager card
  - SCSI and Fibre Channel cables (as needed)
  - Screwdrivers (Phillips and flathead)
  - Allen wrench
  - Multimeter
  - Anti-static wrist strap
  - Management station—a Microsoft Windows-based PC (server)
  - Additional PC or laptop (optional)
  - IP address, subnet mask, and gateway address for Interface Manager card (from Network Administrator)
- Documentation
  - *HP StorageWorks Interface Manager and Command View ESL Installation Guide* (this guide)
  - *HP StorageWorks Interface Manager and Command View ESL Installation Instructions* (optional)
  - Review all safety warnings, cautions, and prerequisites for the ESL9000 Series library, Interface Manager card, and FC interface controllers.

Caution: Parts can be damaged by electrostatic discharge. Keep parts in their containers until needed. Make sure that you are properly grounded when touching static-sensitive components.

Installing the Expansion Cage in the ESL Series Library

The expansion cage is an enclosure that houses up to six expansion boards for the ESL9000 Series libraries. The cage has six, 6U (26.7 cm / 10.5 in) expansion slots. To accommodate the Interface Manager card, which is a 4U card (17.8 cm / 7 in), a 2-slot, 6U to 4U adapter (referred to as a 2U filler panel in earlier documentation) must be installed in the last two slots. The expansion cage is inserted into the top of the electronics bay of the ESL9000 Series library.

Accessing the Electronics Bay

To access the electronics bay:

1. Power down the ESL9000 Series library as follows:
   a. Press **Standby** on the front control panel of the library to place the library off-line. Verify that the control panel indicates `System Off-line`.
   b. Check the **Overview** screen of the control panel to verify that the gripper is empty. If there is a tape cartridge in the gripper, perform a `move` command to place the cartridge in an available storage bin.
   c. Turn off the power switch located below the control panel.

Caution: The expansion cage and the expansion cards that it contains are not hot-pluggable. To avoid damage to equipment and possible loss of data, make sure that the library is properly powered down, as described in step 1, before proceeding.

2. Open either the center back access door or the right-hand back access door of the library, depending on the model.
3. Turn off both circuit breakers on the AC power distribution assembly located in the base of the library cabinet behind the rear access panel.
4. Loosen the two thumbscrews at the top of the electronics bay frame. Carefully tilt the electronics bay outward, as shown in Figure 4.

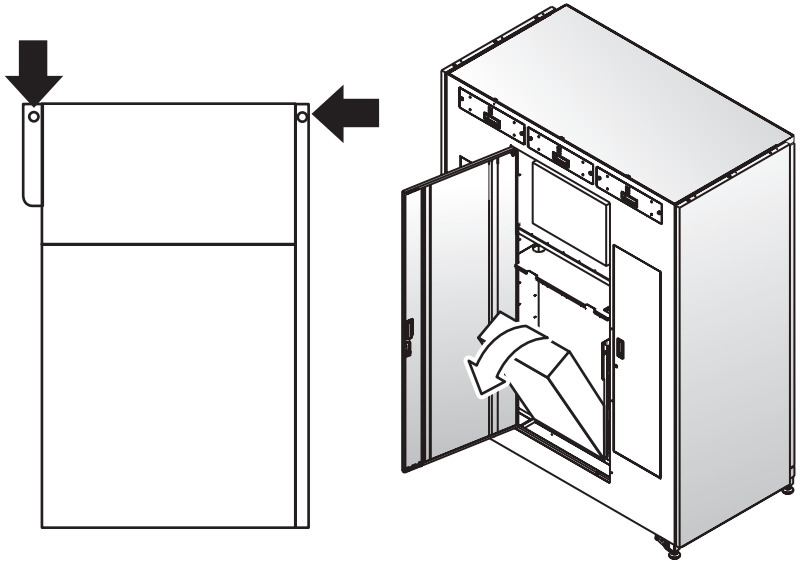


Figure 4: Accessing the electronics bay

5. If this is a first-time installation, using a Phillips screwdriver, remove the four screws at the corners of the top cover of the electronics bay, then remove the cover. Place the screws in a safe place for use later in the procedure.

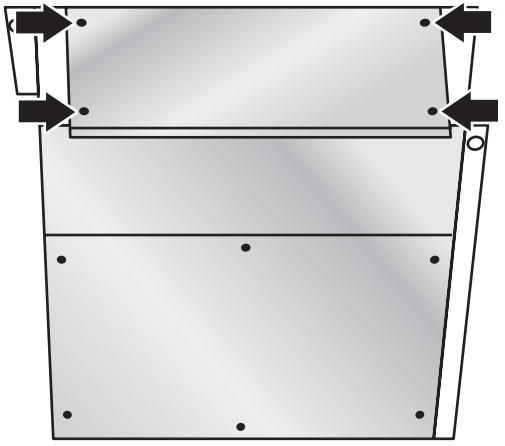


Figure 5: Removing the electronics bay cover

The following procedures, Installing the Cooling Fan, Installing the Expansion Cage, and Installing the Cable Clamp, only apply to first-time installations. If this is a first time installation, proceed with Installing the Cooling Fan. Otherwise, do one of the following:

- If you are installing additional FC interface controllers with the Interface Manager card, skip to the section, Installing the Fibre Channel Interface Controllers into the Expansion Cage.
- If you are installing only the Interface Manager card, skip to the section, Installing the Interface Manager Card into the Expansion Cage.

Installing the Cooling Fan

The expansion cage requires a cooling fan to provide airflow through the cage. This fan must be installed into the electronics bay before the cage is installed. To install the fan:

1. Remove the screws that are attached to the fan and put them in a safe place.
2. Position the fan so that the feet angle downward towards the holes in the side wall.
3. Position the fan cable against the side wall of the electronics bay and drop it down through the opening in the floor of the bay.
4. Seat the fan by inserting the feet into the last row of available holes on the electronics bay wall.

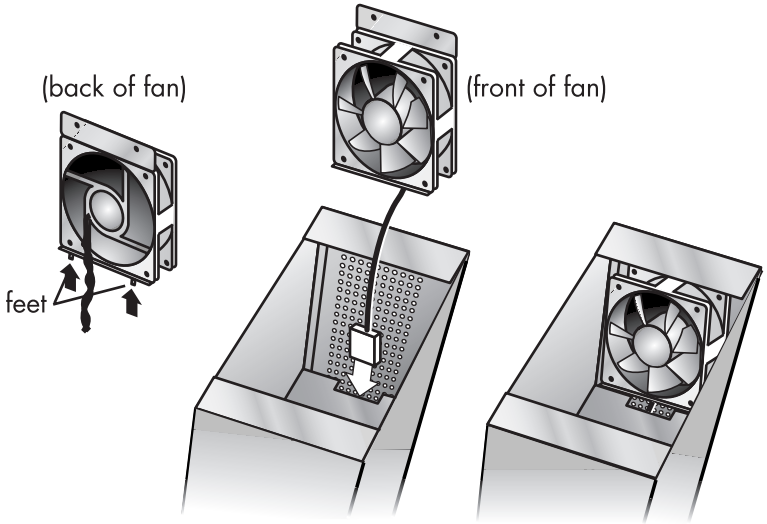


Figure 6: Seating the cooling fan

5. Using a Phillips screwdriver and the two screws that you removed in step 1, mount the fan assembly to the upper right side of the electronics bay.

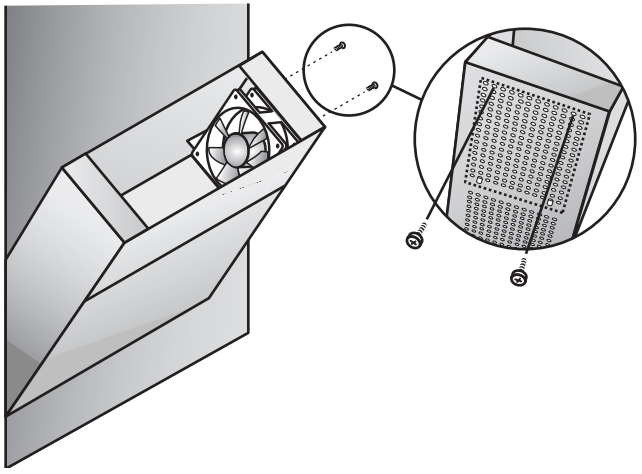


Figure 7: Mounting the cooling fan to the electronics bay

6. Push the electronics bay back into the library and finger tighten the two captive screws at the top of the electronics bay frame.

7. Using a Phillips screwdriver, remove the six screws securing the cover to the electronics bay. Make sure that you support the bottom of the cover while removing the screws.

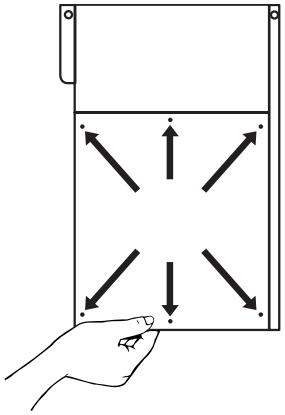


Figure 8: Removing the electronics bay side cover

8. Route the fan cable to the right of any existing cards.

Caution: The area for the fan power cable is limited. Route the cable as far back on the electronics bay as it will go. This prevents the cable from being damaged when the expansion cage is installed.

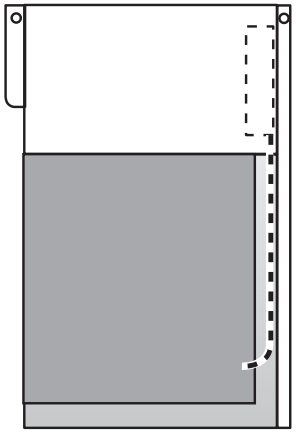


Figure 9: Routing the fan cable

9. Plug the fan assembly power cable into connector J14 on the robotics backplane.

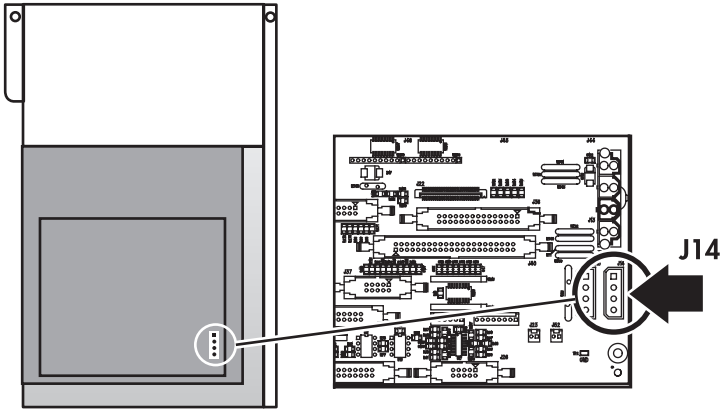


Figure 10: Plugging the fan power cable into the backplane

Installing the Expansion Cage

> **Caution:** If you have not installed the cooling fan for the expansion cage, refer to the previous section, Installing the Cooling Fan, to install the fan. To prevent thermal damage to the equipment, do not install the card cage without first installing the cooling fan.

To install the expansion cage:

1. Loosen the two captive screws at the top of the electronics bay frame and carefully tilt the electronics bay outward.
2. Inspect the connector pins on the outside bottom of the expansion cage as shown in Figure 11. Make sure that no pins are bent or touching.

> **Caution:** If a connector pin is bent or damaged, replace the expansion cage. Do not attempt to fix the pin. A defective pin can damage the library.

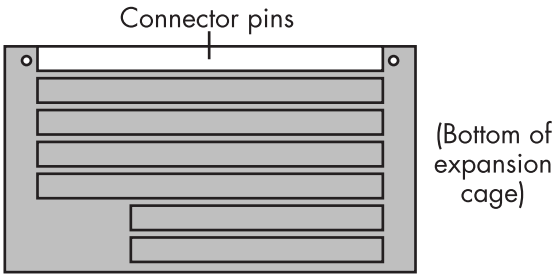


Figure 11: Expansion cage connector pins

3. Locate the guide pins for alignment. Lower the expansion cage into the electronics bay into the guide pin holes located on the PCI backplane.

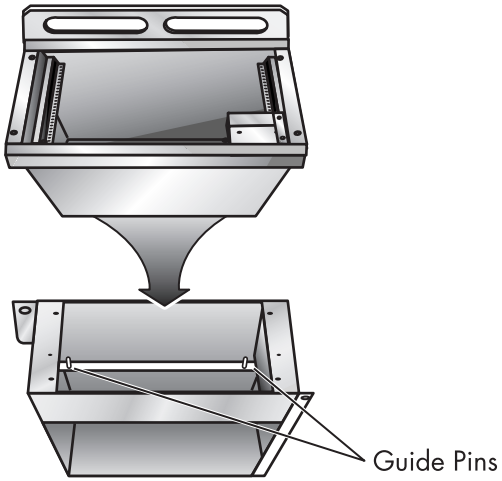


Figure 12: Aligning the guide pins

4. Press down evenly on both sides of the expansion cage until it is firmly seated.

Caution: Be careful not to pinch the fan power cable.

Caution: Make sure that the connectors on the expansion cage and the PCI backplane align properly.

5. Using a Phillips screwdriver, secure the expansion cage into the electronics bay by replacing the two rear cover screws.

Note: Do not replace the two front cover screws yet.

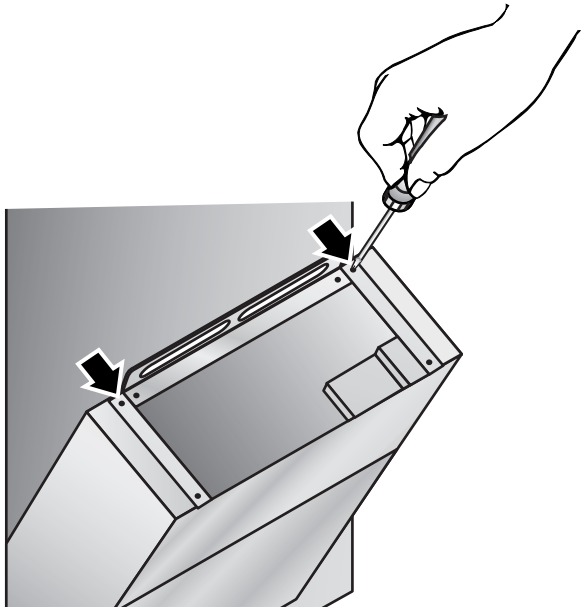


Figure 13: Securing the expansion cage into the electronics bay

Installing the Cable Clamp

1. If they are not already installed, install the cable clips into each cable clamp starting with the first position from the left edge of the clamp, as shown in Figure 14.

Note: The library rear door may not close if clips are placed in the fourth and fifth openings on the right edge of the cable clamp. If necessary, use the extra clips with adhesive backing and attach them to the left side of the electronics bay frame.

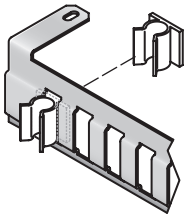


Figure 14: Installing the cable clips into the cable clamp

2. Install the upper cable clamp on the expansion cage using the remaining two top cover screws.

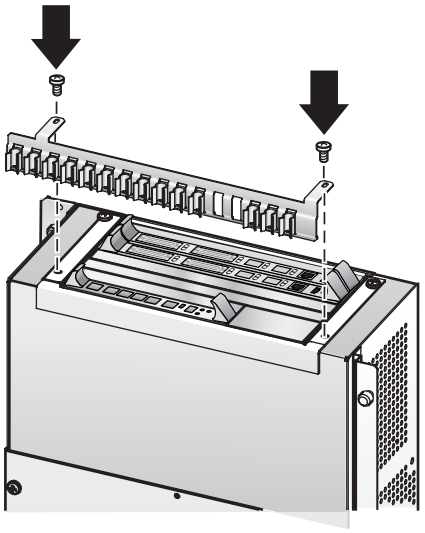


Figure 15: Installing the upper cable clamp

Completing the Installation

1. Use a multimeter to measure the resistance shown on the PCI backplane. Place one lead on ground and the other lead on the +3.3V, +5V, and +12V test points to be checked. If the multimeter shows a short, check the expansion cage and fan to ensure proper connections.

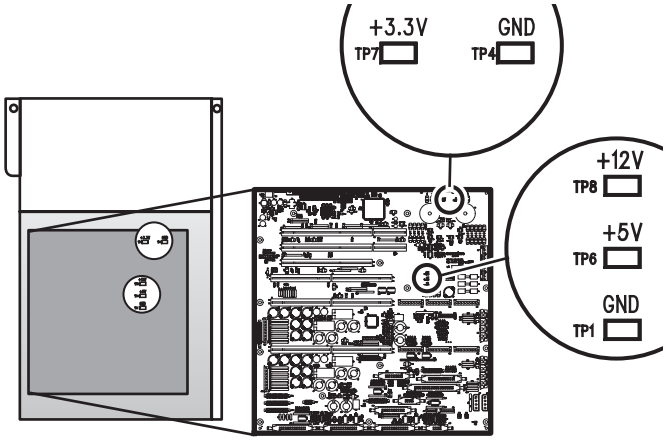


Figure 16: Checking the resistance on the PCI back plane

2. Reinstall the electronics bay cover using the top three screws only. Install the lower cable clamp on the electronics bay cover using the bottom three screws.

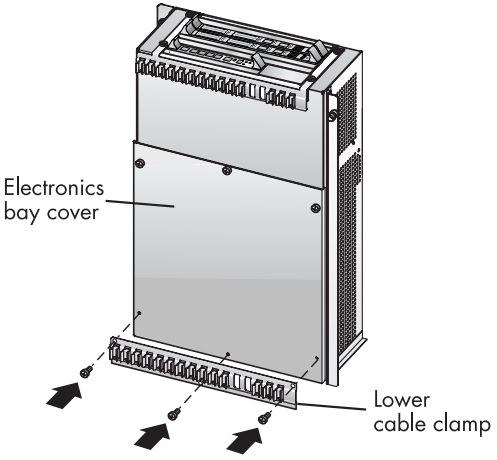


Figure 17: Installing the electronics bay cover and lower cable clamp

Installing the Fibre Channel Interface Controllers into the Expansion Cage

This section explains how to install one or more HP StorageWorks e2400-160 Fibre Channel Interface Controllers into the ESL9000 Series library expansion cage. The e2400-160 FC Interface Controller is a 6U (26.7 cm / 10.5 in) card and requires the full length of the expansion cage.

Upgrading from previous Fibre Channel Interface Controllers

Although it is possible for the Interface Manager card to coexist with (but not manage) older 4U FC interface controllers, HP does not support this configuration. If you are using the older 4U FC interface controllers, HP recommends upgrading these controllers to the e2400-160 FC Interface Controller. This will ensure that you experience the full potential of the Interface Manager card.

If you are using the older 4U FC interface controllers, you most likely have the 6-slot 6U to 4U adapter installed. This adapter must be replaced with the 2-slot 6U to 4U adapter before you can install the e2400-160 Interface Controllers. The 2-slot 6U to 4U adapter upgrade kit must be purchased separately. Refer to the documentation that ships with the upgrade kit for installation instructions.

Note: The 2-slot 6U to 4U adapter and the 6-slot 6U to 4U adapters were referred to as 2U (for 2-slot) or 6U (for 6-slot) filler panels in earlier documentation.

Installing the Fibre Channel Interface Controllers

1. Push the ejector handles so that they extend towards the outer edges of the FC interface controller.

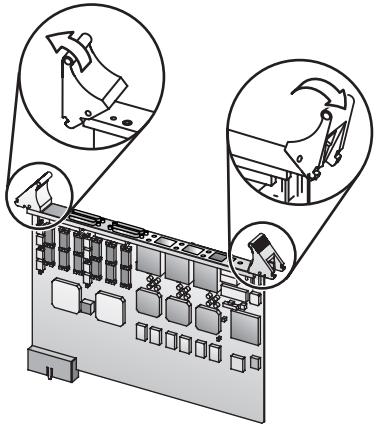


Figure 18: e2400-160 Interface Controller ejector handles

2. With the SCSI ports located to your left as you face the back of the library, align the sides of the controller with the guides in the designated slot in the expansion cage.

3. Gently push the controller into the expansion cage slot, ensuring that the alignment pin on the controller aligns with the alignment hole in the corresponding cage slot. Push the controller until the ejector handles engage the metal rails on the top of the cage.

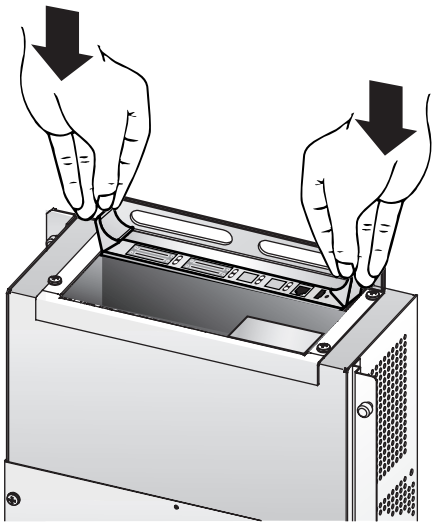


Figure 19: Inserting the controller

4. Push the ejector handles inward to lock the controller in place.

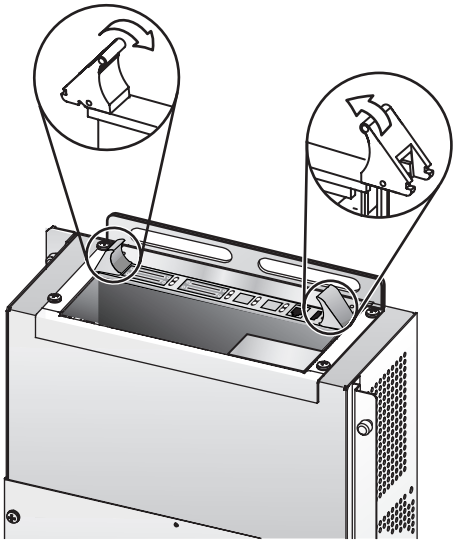


Figure 20: Locking the controller in place

5. Repeat step 1 through step 4 for each controller to be installed.
6. Install 6U filler panels (slot covers) into any unused slots.

Caution: Failure to install filler panels in unused slots may result in thermal damage to the hardware.

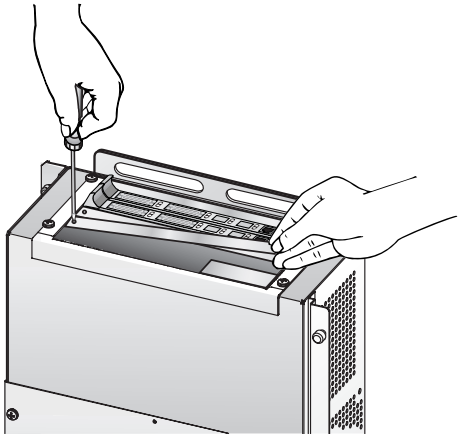


Figure 21: Installing filler panels in unused slots

7. Tighten the captive screws to secure the e2400-160 FC Interface Controllers into the expansion cage.

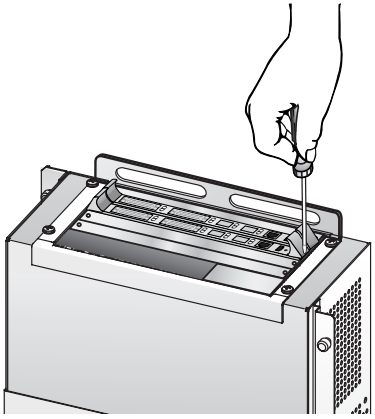


Figure 22: Securing the interface controllers to the cage

Installing the Interface Manager Card into the Expansion Cage

This section explains how to install the Interface Manager card into the ESL9000 Series library expansion cage. The Interface Manager card is a 4U (17.8 cm / 7 in) card and requires a 2-slot 6U to 4U adapter. This adapter is preinstalled in the expansion cage that ships with the Interface Manager card. If this is an upgrade installation, then you may need to replace the adapter. See Upgrading from previous Fibre Channel Interface Controllers for more information.

Caution: To prevent damage to the hardware, do not attempt to install the Interface Manager card into a full length (6U) slot in the expansion cage. The 2-slot 6U to 4U adapter must be installed in the expansion cage to provide the required 4U slots. The Interface Manager card can be installed into either of the available 4U slots.

Upgrading from previous Fibre Channel Interface Controllers

Although it is possible for the Interface Manager card to coexist with (but not manage) older 4U FC interface controllers, HP does not support this configuration. If you are using the older 4U FC interface controllers, HP strongly recommends upgrading these controllers to the e2400-160 FC Interface Controller. This will ensure that you experience the full potential of the Interface Manager card.

If you are using the older 4U FC interface controllers, you most likely have the 6-slot 6U to 4U adapter installed. This adapter must be replaced with the 2-slot 6U to 4U adapter before you can install the e2400-160 Interface Controllers. The 2-slot 6U to 4U adapter upgrade kit must be purchased separately. Refer to the documentation that ships with the upgrade kit for installation instructions.

Note: The 2-slot 6U to 4U adapter and the 6-slot 6U to 4U adapters were referred to as 2U (for 2-slot) or 6U (for 6-slot) filler panels in earlier documentation.

Installing the Interface Manager Card

1. Push the ejector handles so that they extend towards the outer edges of the Interface Manager card.

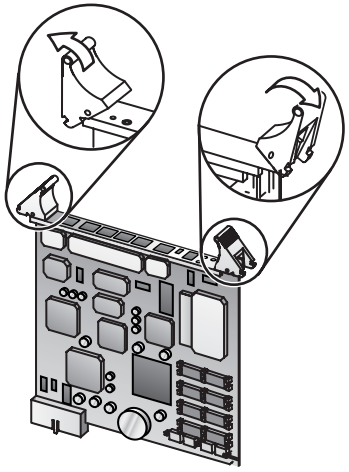


Figure 23: Interface Manager card ejector handles

2. Align the sides of the Interface Manager card with the guides in either one of the 4U slots in the expansion cage as shown in Figure 24.

3. Gently push the Interface Manager card into the expansion cage slot, making sure that the alignment pin on the card aligns with the alignment hole in the corresponding cage slot. Push the card until the ejector handles engage the metal rails on the top of the cage.

Note: If this is an upgrade installation, you will need to remove a 4U filler panel before installing the Interface Manager card.

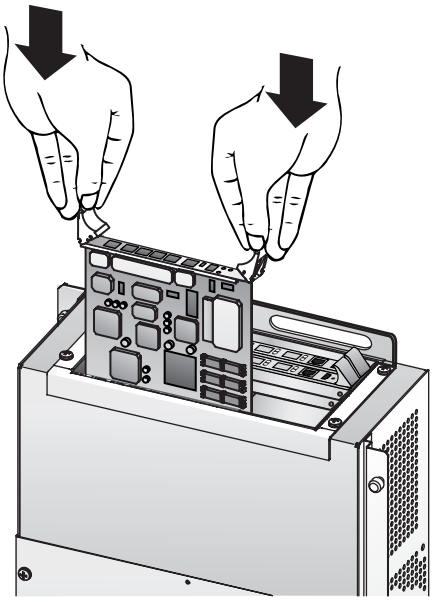


Figure 24: Inserting the Interface Manager card

4. Push the ejector handles inward to lock the card in place.

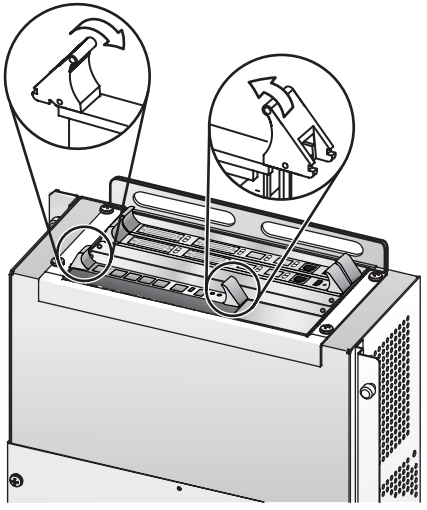


Figure 25: Locking the Interface Manager card in place

5. If necessary, install a 4U filler panel (slot cover) into the unused 4U slot.

Caution: Failure to install filler panels in unused slots may result in thermal damage to the hardware.

6. Tighten the captive screws to secure the Interface Manager card into the expansion cage.

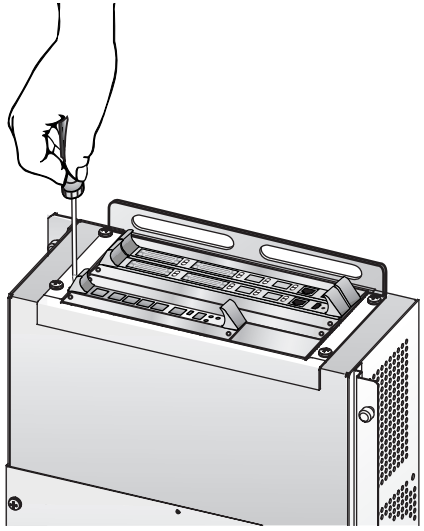


Figure 26: Securing the Interface Manager card to the cage

Connecting the Cables

After installing the Interface Manager card and FC interface controllers, the next step is to connect the cables. This procedure is divided into the following steps:

1. Connecting the Interface Manager Card to the Fibre Channel Interface Controllers using the supplied Ethernet cable bundle
2. Connecting the SCSI Bus Cables to the main SCSI bus of the library
3. Connecting the Fibre Channel Cables to the FC interface controllers
4. Connecting the Interface Manager Card to the LAN
5. Connecting the PC or Laptop to the Interface Manager card

Connecting the Interface Manager Card to the Fibre Channel Interface Controllers

The Interface Manager card is connected to up to four FC interface controllers using the supplied Ethernet cable bundle. This bundle consists of four short Ethernet cables that are grouped together with shrinkable tubing. Connect the cables as follows:

1. Connect the four connectors from one end of the Ethernet cable bundle to the four Ethernet ports labeled “To Fibre Channel Controllers” on the Interface Manager card. Be sure to connect all four Ethernet cables from the Ethernet cable bundle, even if you are not using four FC interface controllers.

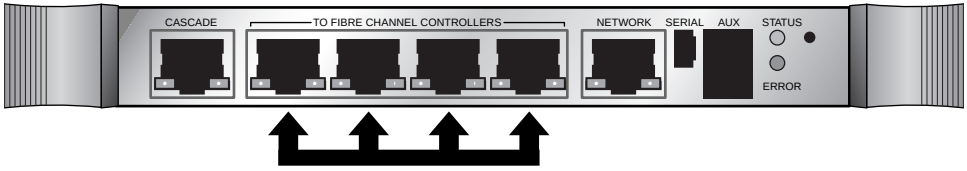


Figure 27: Connecting the Ethernet cable bundle to the Interface Manager card

2. Connect each of the connectors from the other end of the Ethernet cable bundle to the Ethernet port on the FC interface controllers.

Note: The order in which the four Ethernet ports labeled "To Fibre Channel Controllers" on the Interface Manager card are connected to the FC interface controllers is inconsequential. If less than four FC interface controllers are installed, leave the unused connectors from the Ethernet cable bundle hanging.

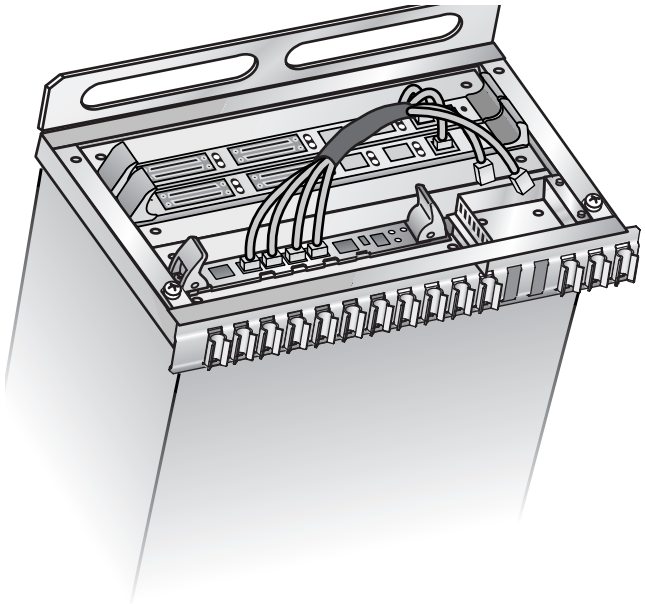


Figure 28: Connecting the Interface Manager card to the FC interface controllers

Connecting the SCSI Bus Cables

1. Connect the SCSI connectors on the FC interface controllers to the SCSI connectors on the library SCSI bulkhead. See ESL9322 SCSI Cable Configurations or ESL9595 SCSI Cable Configurations for detailed SCSI cabling instructions.
2. Secure the SCSI cables going from the controller to the library bulkhead by snapping them into the clips in the upper and lower cable clamps located on the electronics enclosure, as shown in Figure 29. To prevent interference with the door, do not use the fourth and fifth clips from the right edge of the cable clamp.

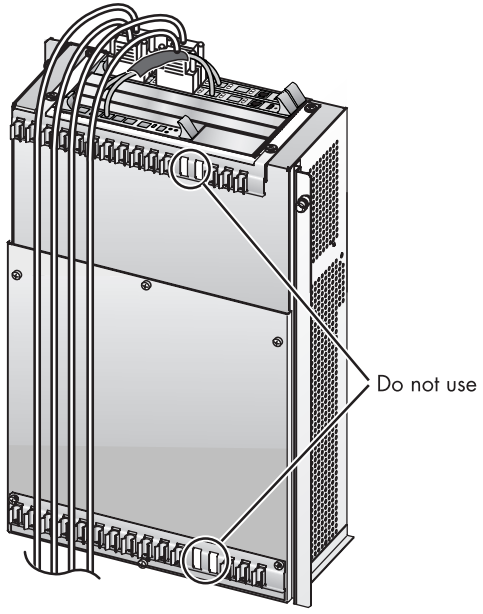


Figure 29: Securing the SCSI cables

ESL9322 SCSI Cable Configurations

Figure 30 shows the SCSI ports as viewed from the rear of the ESL9322 tape library.

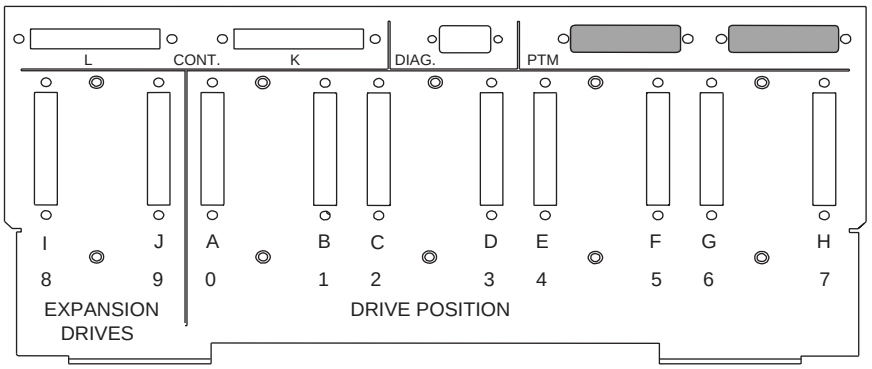


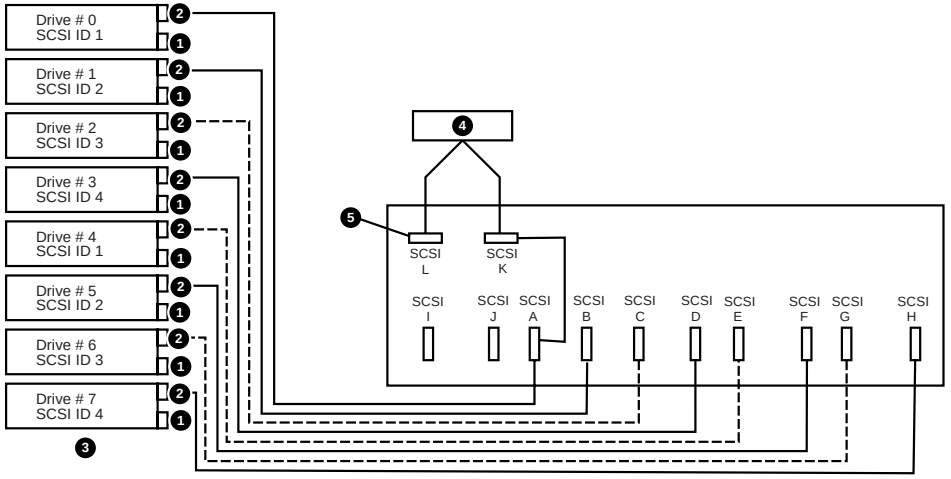
Figure 30: SCSI ports (ESL9322)

Looking from the rear of the ESL9322 tape library, connect the SCSI cables and terminators as shown in Figure 31.

Note: ESL9322 Series libraries are equipped with internal SCSI cables and terminators in place for a one drive per SCSI bus configuration. This is the recommended configuration (and the required configuration for Ultrium 460 drives) and ensures optimal performance.

Figure 31 shows the internal SCSI cabling. The connectors are on the SCSI ports that are shown in Figure 30.

Note: Drive numbering begins with 0. Consequently, the first drive is drive 0, the second drive is drive 1, and so on.



1 Terminators
2 SCSI cables
3 Drive Column 1
4 Robotic Controller
5 Host SCSI Cable

Figure 31: Internal SCSI cabling configuration (ESL9322)

Table 3: SCSI Ports and Device Connections (ESL9322)

SCSI Port Identifier	Device Connection
A	Drive 0
B	Drive 1
C	Drive 2
D	Drive 3
E	Drive 4
F	Drive 5
G	Drive 6
H	Drive 7
I	Not used
J	Not used
K	Robot
L	Host

ESL9595 SCSI Cable Configurations

Figure 32 shows the SCSI ports as viewed from the rear of the ESL9595 tape library.

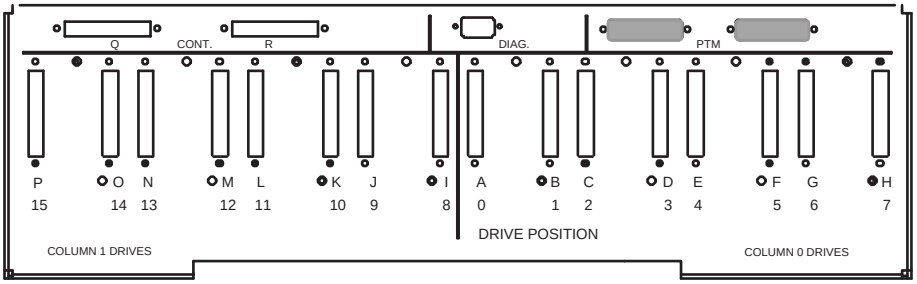


Figure 32: SCSI ports (ESL9595)

Looking from the rear of the library, connect the SCSI cables and terminators as shown in Figure 33.

Note: ESL9595 Series libraries are equipped with internal SCSI cables and terminators in place for a one drive per SCSI bus configuration. This is the recommended configuration (and the required configuration for Ultrium 460 drives) and ensures optimal performance.

Figure 33 shows the internal SCSI cabling. The connectors are on the SCSI ports that are shown in Figure 32.

Note: Drive numbering begins with 0. Consequently, the first drive is drive 0, the second drive is drive 1, and so on.

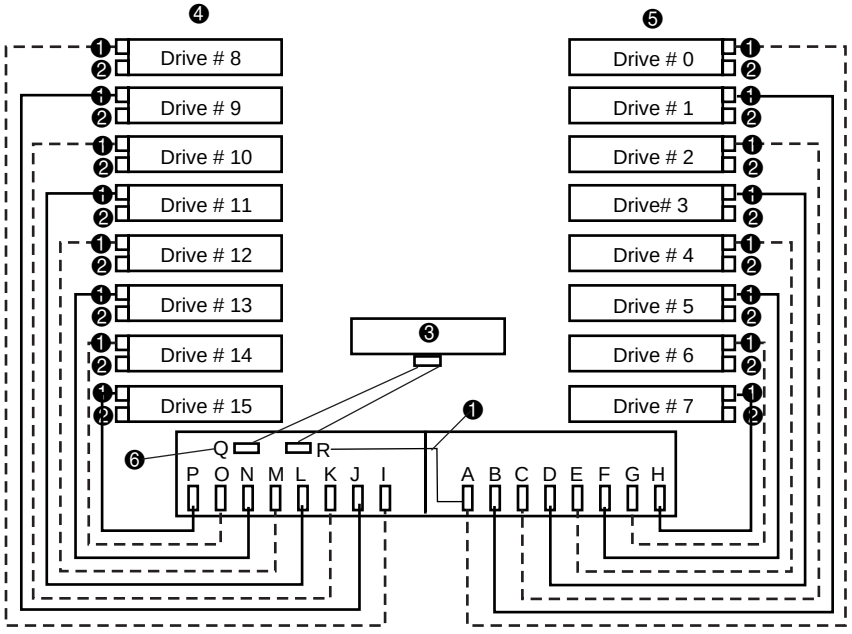


Figure 33: Internal SCSI cabling configuration (ESL9595)

❶ SCSI cables (8)
❷ Terminators (8)
❸ Robotic controller
❹ Drive column 1
❺ Drive column 2
❻ Host SCSI Cable

Table 4: SCSI Ports and Device Connections (ESL9595)

SCSI Port Identifier	Device Connection
A	Drive 0
B	Drive 1
C	Drive 2
D	Drive 3
E	Drive 4
F	Drive 5
G	Drive 6
H	Drive 7
I	Drive 8
J	Drive 9
K	Drive 10
L	Drive 11
M	Drive 12
N	Drive 13
O	Drive 14
P	Drive 15
Q	Host
R	Robot

Connecting the Fibre Channel Cables

Connect the FC cables from any external fibre devices to the FC connectors on the FC interface controllers. Route the FC cables through the access port on the back of the library.

Caution: Do not pinch the Fibre Channel cables or bend them in such a way that the radius of the bend is less than two inches.

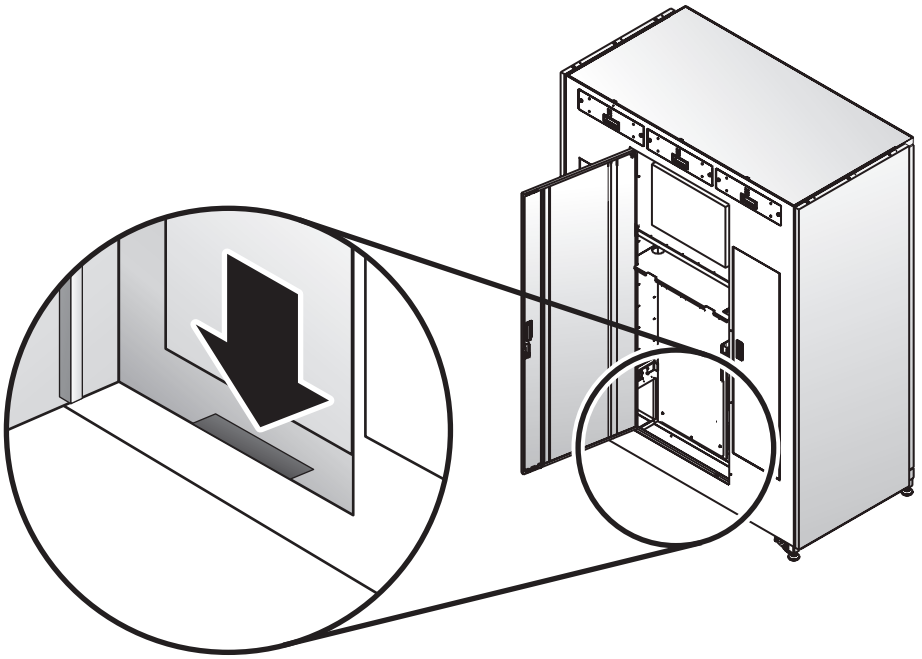


Figure 34: Cable access port

Connecting the Interface Manager Card to the LAN

To connect the Interface Manager card to the LAN, connect a standard RJ-45 Ethernet cable from the LAN to the Ethernet port labeled “Network” on the Interface Manager card.

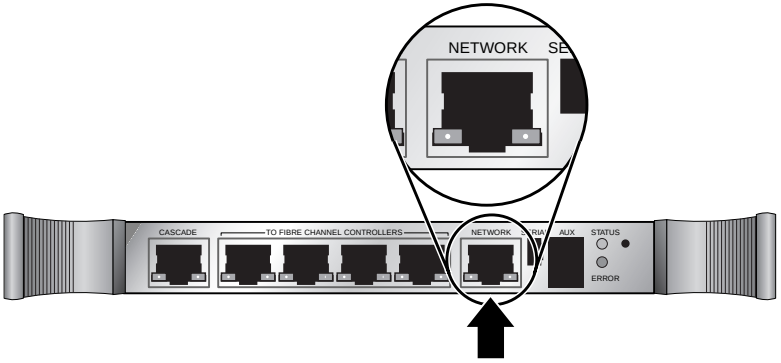


Figure 35: Connecting the Interface Manager card to the LAN

Connecting the PC or Laptop

To prepare for the configuration procedure, you must directly connect the Interface Manager card to the management station (or any other PC or laptop) to configure the network IP address of the Interface Manager card. The network configuration for the PC or laptop that you use to connect to the Interface Manager card must be set to use DHCP.

Connect the PC or laptop to the Interface Manager card using one of the following methods:

- **Telnet method**—uses a standard RJ-45 Ethernet cable to connect the network port of the PC or laptop to the cascade port of the Interface Manager card. After connecting, Telnet into the cascade port to obtain the network IP address of the Interface Manager card (see Getting or Setting the Interface Manager IP Address for detailed instructions). This is the preferred method because it uses a standard network cable and requires less configuration.
- **Serial method**—uses a special serial cable (included with the Interface Manager card) to connect the serial port of the PC or laptop to the 3-pin serial port of the Interface Manager card. This method requires a terminal emulation program to obtain the network IP address of the Interface Manager card (see Getting or Setting the Interface Manager IP Address for detailed instructions).

Telnet Method

Connect a standard RJ-45 Ethernet cable from the network port of the PC or laptop to the cascade port of the Interface Manager card. Route the cable through the access port on the back of the library.

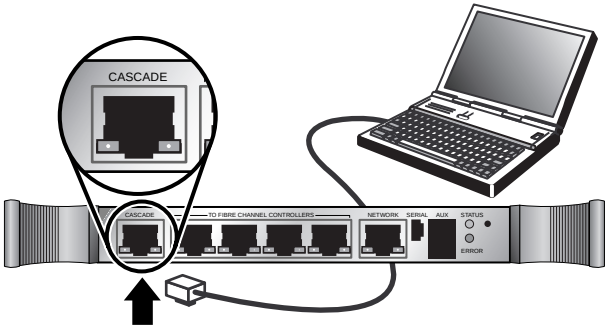


Figure 36: Connecting to the cascade port

Serial Method

1. Connect the small end of the included serial cable to the 3-pin serial connector on the Interface Manager card. The connector is keyed so that the cable can only be installed in the correct orientation. Route the cable through the access port on the back of the library.
2. Connect the other end of the serial cable to an available serial port on the PC or laptop.

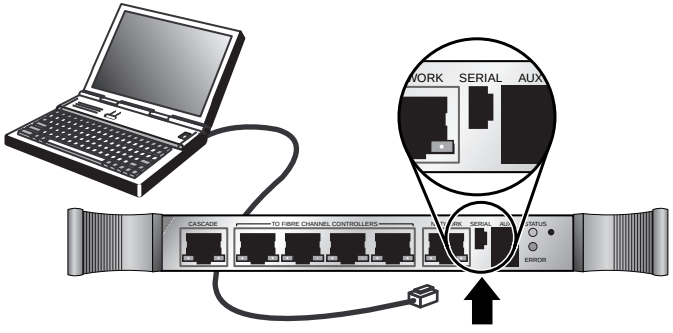


Figure 37: Connecting to the serial port

Completing the Hardware Installation

After installing the required hardware:

1. Verify that filler panels are installed in all unused slots in the expansion cage.
2. Push the electronics bay back into the library cabinet and finger-tighten the two thumbscrews to secure the electronics bay in place.
3. Power on the library using the following sequence:
   a. Turn on both circuit breakers on the AC power distribution assembly.
   b. Verify that all access panels are closed, all back panel cable connections are firmly in place, and all doors are closed.
   c. Turn on the power switch located below the control panel.
4. If necessary, see Troubleshooting in this guide or the troubleshooting chapter in the *HP StorageWorks e2400-160 Fibre Channel Interface Controller User Guide* to resolve any POST diagnostic issues.
5. After successfully installing the hardware, proceed to Configuration and Software Installation.

Configuration and Software Installation

3

This chapter describes how to configure the Interface Manager card for first-time use. This chapter also provides instructions for installing and configuring Command View ESL software that is included with the expansion cage and Interface Manager kit.

Before attempting to configure the Interface Manager card, make sure that:

- You have successfully completed the hardware installation as described in Chapter 2, "Hardware Installation."
- You have the management station (or another PC or laptop) connected to the Interface Manager card via the cascade or serial port (see Connecting the PC or Laptop).
- The library and PC are powered on.

User Interface Overview

This section explains the different types of user interfaces (UIs) that are used with the Interface Manager card, what each UI is used for, and when each UI should be used. The Interface Manager card supports three different UIs:

- **Serial**—uses a command line interface (CLI) and connects directly to the Interface Manager card through an RS232 serial interface rather than through the LAN. The serial UI takes precedence over the Command View ESL and Telnet UIs and will prevent any other open sessions from communicating with the Interface Manager card.

Note: If you use Telnet to change the IP address of the Interface Manager card, you will have to logon to a new Telnet session with the new IP address.

- **Telnet**—uses the same CLI as the serial interface, but requires the IP address of the Interface Manager card to initiate the session. The advantage of using Telnet over the serial interface is that users can Telnet from any client machine that is on the LAN; a separate serial connection is not needed. The Telnet UI has precedence over the Command View ESL GUI and will prevent any open Command View ESL sessions from communicating with the Interface Manager card.
- **Command View ESL**— is a browser-based graphical user interface (GUI). This is the preferred UI for controlling the Interface Manager card and should be used in most circumstances. From any client on the LAN, users can use a browser to access the Command View ESL, which is hosted on a management station. For more information on using Command View ESL, refer to Chapter 2, "Command View ESL," of the *HP StorageWorks Interface Manager and Command View ESL User Guide.*

Note: For a complete list of CLI commands, refer to Appendix A, "CLI Command Reference," in the *HP StorageWorks Interface Manager and Command View ESL User Guide*.

Order of Precedence of User Interfaces

The order of precedence of the three UIs used with the Interface Manager card is as follows:

1. Serial
2. Telnet
3. Command View ESL

Only one session can be open at a time (serial, Telnet, or Command View ESL). However, it is possible to have multiple Command View ESL GUI clients open simultaneously because these clients all share in the same single session that is running on the management station. If a user attempts to open a session when another session of higher priority is currently open, the system will display an error message and the lower priority session will not start. If a user attempts to open a session when another session of lower priority is currently open, the system warns the user that another session is currently open and asks if it is OK to terminate the lower priority session.

Caution: While it is possible for an administrator to terminate other sessions by opening a serial or Telnet session, this is not recommended. If, for example, someone is performing a firmware upgrade using a Command View ESL GUI client and that session is terminated prematurely, the firmware upgrade would fail and could cause the device being upgraded to require physical repair.

Getting or Setting the Interface Manager IP Address

Before the Interface Manager card can be used properly, you must configure the network IP address of the card. The Interface Manager card ships with dynamic host configuration protocol (DHCP) mode enabled and will attempt to assign itself an IP address automatically when powered on. After powering on the library and management station (or other PC or laptop that is connected to the Interface Manager card via the cascade or serial port), do one of the following:

- If DHCP mode was successful and the Interface Manager card obtained an IP address, use the CLI to view the IP address. Record the IP address for use when configuring the Command View ESL or using the Telnet interface.
- If DHCP mode was not successful in obtaining an IP address, obtain an available static IP address from your network administrator, and then use the CLI to set the IP address.

Using the CLI to Configure the Network IP Address

There are two methods for connecting to the Interface Manager card and using the CLI to configure the network IP address:

- **Telnet method**—uses a standard RJ-45 Ethernet cable to connect the network port of the PC or laptop to the cascade port of the Interface Manager card. After connecting, Telnet into the cascade port to obtain the network IP address of the Interface Manager card. This is the preferred method because it uses a standard network cable and requires less configuration.
- **Serial method**—uses a special serial cable (included with the Interface Manager card) to connect the serial port of the PC or laptop to the 3-pin serial port of the Interface Manager card. This method requires a terminal emulation program to obtain the network IP address of the Interface Manager card.

Using the Telnet Method

1. If you have not already done so, connect a standard RJ-45 Ethernet cable from the network port of a PC or laptop to the cascade port on the Interface Manager card.
2. Start a Telnet session on the PC or laptop that is connected to the Interface Manager card via the cascade port:
   a. From a command prompt, enter the following:

      ```
      telnet 192.168.2.1
      ```

Note: The above IP address is the IP address of the cascade port. It is *not* the network IP address. The cascade IP address is hardcoded into the Interface Manager card and is separate from the network IP address.

---

   b. At the login prompt, enter the following information:
      - Username: `cliadmin`
      - Password: `clipwd`
3. Enter the following command:

   ```
   show network ipaddress
   ```

- If the IP address is 1.1.1.1, then DHCP mode was either disabled, or unable to obtain an IP address automatically. Proceed to step 4 to set the IP address.
- If the IP address is anything other than 1.1.1.1, then DHCP obtained the IP address automatically. If you choose to keep this IP address, then record it and proceed to step 5. To change the address, continue with step 4. You will need the IP address when configuring the Command View ESL or using the Telnet interface.

Note: HP does not recommend using the IP address assigned by DHCP to the Interface Manager card because it is not a static IP address. With DHCP enabled, the Interface Manager card will attempt to obtain an IP address every time the card is rebooted. The new IP address may or may not be the same as the previous address. If the IP address changes, Command View ESL will reconfigure itself automatically with the new IP address, but the new IP address must be determined before using the Telnet UI.

DHCP is intended to help you get up and running quickly. However, the preferred method is to obtain the IP address, subnet mask, and gateway address from your network administrator and manually configure the Interface Manager card with these settings. Doing so automatically disables DHCP mode and ensures that the IP address remains the same after successive reboots.

4. To change the IP address enter the following command:

   `set network ipaddress <IP address> <subnet mask> <gateway address>`

   For example:

   `set network ipaddress 10.1.2.3 255.255.248.0 10.255.255.255`

   This command requires the IP address, subnet mask, and gateway address as arguments. If any of the arguments are omitted, the command is ignored. The system displays `done` when the IP address has been successfully set. This command automatically disables DHCP mode.

Note: If you later want to re-enable DHCP mode, use the following command:

`set network dhcp`

5. Use the `exit` command to end the Telnet session.
6. Disconnect the Ethernet cable from the cascade port of the Interface Manager card.
7. Using a 5/32 inch Allen wrench, close and secure the back access door of the library.

Using the Serial Method

To use the serial UI, you must use a terminal emulation program on the management station (or other PC or laptop that is connected to the Interface Manager card via the serial cable). HyperTerminal is a commonly used, Windows-based terminal emulation program.

To start the serial session:

1. If you have not already done so, connect the small end of the included serial cable to the 3-pin serial connector on the Interface Manager card. Connect the other end of the serial cable to an available serial port on the PC or laptop.
2. Start the terminal emulation program. A variety of programs may be used, but HyperTerminal is the most common. To start HyperTerminal, click **Start > Programs > Accessories > Communications > HyperTerminal**.
3. Set the communications settings as follows:
   - Port Speed: **9600**
   - Data Bits: **8**
   - Parity: **none**
   - Stop bits: **1**
   - Flow control: **none**
4. At the login prompt, use the following information:
   - Username: `cliadmin`
   - Password: `clipwd`
5. Enter the following command:

   ```
   show network ipaddress
   ```

- If the IP address is 1.1.1.1, then DHCP mode was either disabled, or unable to obtain an IP address automatically. Proceed to step 6 to set the IP address.
- If the IP address is anything other than 1.1.1.1, then DHCP obtained the IP address automatically. If you choose to keep this IP address, then record it and proceed to step 7. To change the address, continue with step 6. You will need the IP address when configuring the Command View ESL or using the Telnet interface.

Note: HP does not recommend using the IP address assigned by DHCP to the Interface Manager card because it is not a static IP address. With DHCP enabled, the Interface Manager card will attempt to obtain an IP address every time the card is rebooted. The new IP address may or may not be the same as the previous address. If the IP address changes, Command View ESL will reconfigure itself automatically with the new IP address, but the new IP address must be determined before using the Telnet UI.

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   For example:

   `set network ipaddress 10.1.2.3 255.255.248.0 10.255.255.255`

   This command requires the IP address, subnet mask, and gateway address as arguments. If any of the arguments are omitted, the command is ignored. The system displays `done` when the IP address has been successfully set. This command automatically disables DHCP mode.

Note: If you later want to re-enable DHCP mode, use the following command:

`set network dhcp`

7. Use the `exit` command to end the serial session.
8. Disconnect the serial cable from the Interface Manager card.
9. Using a 5/32 inch Allen wrench, close and secure the back access door of the library.

Using Command View ESL

Command View ESL is installed on the management station and communicates with the Interface Manager card through the LAN. The management station processes information from the Interface Manager card and "serves up" the Command View ESL GUI. Users can access the Command View ESL, either from the management station directly or through any client on the LAN, by using a browser-based GUI interface.

This section explains how to install and configure Command View ESL for first time use. For more detailed information on using the Command View ESL, refer to the *HP StorageWorks Interface Manager and Command View ESL User Guide.*

Prerequisites

For the server side, Command View ESL requires a management station (server) with a minimum of:

- Pentium III 500-MHz, 256-MB RAM
- 10/100 Base-T network card (a static IP address is recommended)
- Microsoft Windows 2000 Professional or Server edition SP3, Windows XP Professional

For the client side, Command View ESL requires the following:

- Microsoft Internet Explorer v6.0 SP1 or later, or Netscape Navigator v6.2 or later. Make sure that Java support is enabled in the browser
- An Internet connection is required for Command View ESL to receive firmware and software release information automatically from the HP support website.

Installing Command View ESL

To install the Command View ESL software:

1. Insert the Command View ESL software CD into the CD-ROM drive of the management station.
2. If autorun is disabled on the CD-ROM drive, locate and double-click the *setup.exe* file on the CD.
3. Follow the instructions on the screen to complete the installation.
4. Reboot the management station.

Command View ESL is essentially a web server that serves up a GUI interface to web clients. Command View ESL runs on the management station as a service. By default, this service starts automatically whenever the management station is booted, and runs invisibly in the background. In most cases, the default installation settings are adequate.

If you ever need to stop Command View ESL from running, use the Services applet that is included with Windows. To access the Services applet, click **Start > Settings > Control Panel > Administrative Tools > Services**. Use the Services applet to start and stop services, and to set whether the service is started automatically when the computer is booted. Refer to the online help that comes with the Services applet for more information.

Starting Command View ESL

To start Command View ESL, open your browser, either on the management station or on a computer that is networked to the management station, and enter the following URL in the address field:

`http://<hostname>:4095/` (where <*hostname*> is the IP address or network name of the management station. If you are starting Command View ESL on the management station itself, you can substitute `localhost` for the hostname).

If the Java™ Runtime Environment (JRE) plugin is not already installed on your computer and you are using a Windows OS, Command View ESL will attempt to download and install it for you. If you are prompted to install the JRE plugin, click **OK** and follow the instructions on the screen. If you are using a non-Windows OS, you will be instructed how to download the JRE plugin. If the JRE plugin is not available, then Command View ESL will not run.

After the JRE is successfully installed, the Command View ESL **Launcher** screen is displayed.

Configuring Command View ESL

After installing the Interface Manager card and Command View ESL, you must perform the following configuration steps using Command View ESL:

- Set the Command View ESL administrative password.
- Verify proxy settings for the management station.
- Add all libraries to Command View ESL that will be monitored.
- Add the license key for Command View ESL and any additional features that you have purchased.
- Configure properties for each library.
- Configure host access (Secure Manager).

For complete instructions for each of these configuration steps, see "Initial Configuration Steps" in Chapter 2 of the *HP StorageWorks Interface Manager and Command View ESL User Guide*.

Troubleshooting

4

LED Diagnostic Codes

Table 5: Status LED diagnostic codes

Red LED	Green LED	Description
On	Off	BIOS code failed to run.
Blinks 1x per 5 second interval	Off	Hardware POST failed. No firmware images are loaded.
Blinks 2x per 5 second interval	Off	No CompactFlash disk or valid boot sector image found.
Blinks 3x per 5 second interval	Off	Specified firmware image files were not found. Neither the current nor the previous image was found.
Blinks 4x per 5 second interval	Off	Load or execute command failed (boot code remains at end of process). This indicates that load, decompress, or execution failed on both the current and previous image files.
Off	Blinks 1x per 5 second interval	Load or execute command succeeded. Boot code successfully loaded, decompressed, and initiated execution of one of the image files.

Table 5: Status LED diagnostic codes

Red LED	Green LED	Description
Off	Blinks 2x per 5 second interval	Application software is initializing.
Off	Blinks 3x per 5 second interval	Application is identifying all library components.
Off	On	Normal state. Application has identified all library components.

Table 6: Network Link Activity/Speed LEDs

LED	Status	Description
Link Activity LED (left side of each Ethernet port)	Off	Port disconnected / no link
	On	Port connected to another Ethernet device
	Flashing	Data is being transmitted / received
Link Speed LED (right side of each Ethernet port)	On	Port is operating at 100 Mbps
	Off	Port is operating at 10 Mbps, or port is not connected (see Link Activity LED)

Common Issues

Table 7: Symptoms and Solutions

Symptom	Possible Cause	Solution
Command View ESL server does not detect the Interface Manager card	Bad network connection	Verify that the Interface Manager card and the management station are correctly connected to the LAN.
	Interface Manager card not powered up or in ready state	Power up the library. Observe status and link LEDs.
	Incorrect IP address	Verify that the correct IP address of the Interface Manager card is entered in Command View ESL. 1. See Getting or Setting the Interface Manager IP Address to obtain the correct IP address using the serial interface. 2. Configure Command View ESL with the correct IP address.See Chapter 2, "Command View ESL," of the *HP StorageWorks Interface Manager and Command View ESL User Guide* for information on adding a library.
Interface Manager card does not detect one or more FC interface controllers	Bad network connection	Verify that the Interface Manager card is properly connected to the FC interface controllers and that the cables are good. See Connecting the Interface Manager Card to the Fibre Channel Interface Controllers for more information.
	Incorrect firmware revision	Make sure that the e2400-160 FC interface controller has a minimum firmware revision of 5.1.07.
	Defective Interface Manager card or FC interface controller	Observe status and link LEDs. Replace defective card or controller.
Interface Manager card does not detect drives or library	SCSI cables not connected properly	Check SCSI cabling
	SCSI settings or termination not set properly	■ Check the SCSI settings for the device. ■ Check that the SCSI bus is properly terminated.
	Timing issues	■ Reset the corresponding FC interface controller
	Drive not powered up or in ready state	■ Troubleshoot drive

Symptom	Possible Cause	Solution
Command View ESL does not run in the browser	Incompatible browser version or Java support not enabled	■ Make sure you are using a minimum of Microsoft Internet Explorer v6.0 SP1 or later, or Netscape Navigator v6.2 or later. ■ Make sure that Java support is enabled in the browser.
	Java Runtime Environment (JRE) not installed	Download and install the Java 2 Platform, Standard Edition v1.4 or later from http://wwws.sun.com/software/download/technologies.html.
	Bad network connection or network down	■ Check all physical network connections. If the connections are good, contact your network administrator. ■ Ping the management station. If pinging fails and the IP address is correct, contact your network administrator.
	Wrong IP address	Check the IP address of the management station. On the management station, open a command shell and enter `ipconfig`. You must use this IP address (or the network name of the management station) in the URL to access Command View ESL.
	Management station not running, or Command View ESL service not running on management station.	■ Check to see if the management station is operational. ■ Use the Services applet to verify that the Command View ESL service is running on the management station. Click **Start > Settings > Control Panel > Administrative Tools > Services**.

Symptom	Possible Cause	Solution
Command View ESL opens in browser but returns "Not bound in registry" error message	Management Station has more than one network interface controller (NIC)	■ Disconnect all but one NIC. Use the Services applet to restart the Command View ESL service. Click **Start > Settings > Control Panel > Administrative Tools > Services** to access the Services applet. ■ Navigate to the `config` directory in the Command View ESL installation directory on the Management Station and locate the file *wrapper_rmi.conf*. Using a text editor, edit the file as follows: a. Delete the pound sign (#) at the beginning of the line that starts with "#wrapper.java.additional.1." b. Change the IP address in the same line to the IP address of the NIC card to be used with Command View ESL. c. Save the changes and restart the Command View ESL service using the Services applet. Click **Start > Settings > Control Panel > Administrative Tools > Services** to access the Services applet. **Note:** You must edit the *wrapper_rmi.conf* file every time the IP address of the NIC changes.

Serial and Ethernet Pin Assignments

A

Table 8: RJ-45 network port pinout

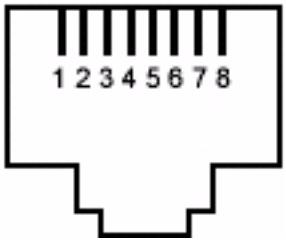
Key	Pin	Description
	1	Transmit out +
	2	Transmit out -
	3	Receive in +
	4	No connection
	5	No connection
	6	Receive in -
	7	No connection
	8	No connection

Table 9: RJ-45 FC interface controller and cascade port pinouts

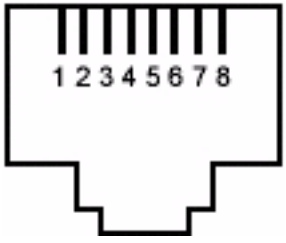
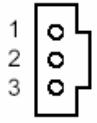
Key	Pin	Description
	1	Receive in +
	2	Receive in -
	3	Transmit out +
	4	No connection
	5	No connection
	6	Transmit out -
	7	No connection
	8	No connection

Table 10: RJ-11 aux port pinout

Key	Pin	Description
	1	No connection
	2	Receive data (driven by host)
	3	Transmit data (driven by IM)
	4	Signal common (ground)

Table 11: 3-pin serial port pinout

Key	Pin	Description
	1	Transmit data (driven by IM)
	2	Signal common (ground)
	3	Receive data (driven by host)

Regulatory Compliance Notice

B

Federal Communications Commissions Notice

Part 15 of the Federal Communications Commission (FCC) Rules and Regulations has established Radio Frequency (RF) emission limits to provide an interference-free radio frequency spectrum. Many electronic devices, including computers, generate RF energy incidental to their intended function and are, therefore, covered by these rules. These rules place computers and related peripheral devices into two classes, A and B, depending upon their intended installation. Class A devices are those that may reasonably be expected to be installed in a business or commercial environment. Class B devices are those that may reasonably be expected to be installed in a residential environment (personal computers). The FCC requires devices in both classes to bear a label indicating the interference potential of the device as well as additional operating instructions for the user.

The rating label on the device shows which class (A or B) the equipment falls into. Class B devices have an FCC logo or FCC ID on the label. Class A devices do not have an FCC logo or FCC ID on the label. Once the class of the device is determined, refer to the following corresponding statement.

Class A Equipment

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at personal expense.

Class B Equipment

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio or television technician for help.

Declaration of Conformity for Products Marked with FCC Logo - U.S. Only

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

For questions regarding your product, refer to http://www.hp.com.

For questions regarding this FCC declaration, contact:

Hewlett-Packard Company
Product Regulations Manager
3000 Hanover St.
Palo Alto, CA 94304

(650) 857-1501

To identify this product, refer to the part, Regulatory Model Number, or product number found on the product.

Modifications

The FCC requires the user to be notified that any changes or modifications made to this device that are not expressly approved by Hewlett-Packard Company may void the user's authority to operate the equipment.

Network and Serial Cables

Connections to this device must be made with shielded cables with metallic RFI/EMI connector hoods in order to maintain compliance with FCC Rules and Regulations.

IEC EMC Statement (Worldwide)

This is a Class A product. In a domestic environment this product may cause radio interference, in which case the user may be required to take adequate measures

Specification ATI Classe A (France)

DECLARATION D'INSTALLATION ET DE MISE EN EXPLOITATION d'un matériel de traitement de I'information (ATI), classé A en fonction des niveaux de perturbations radioélectriques émis, defines dans la norme européenne EN 55022 concernant la Compatibilité Electromagnétique.

Canadian Notice (Avis Canadien)

Class A Equipment

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Class B Equipment

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

European Union Notice

Products bearing the CE marking comply with the EMC Directive (89/336/EEC) and the Low Voltage Directive (73/23/EEC) issued by the Commission of the European Community and if this product has telecommunication functionality, the R&TTE Directive (1999/5/EC).

Compliance with these directives implies conformity to the following European Norms (in parentheses are the equivalent international standards and regulations):

- EN 55022 (CISPR 22) - Electromagnetic Interference
- EN55024 (IEC61000-4-2, IEC61000-4-3, IEC61000-4- 4, IEC61000-4-5, IEC61000-4-6, IEC61000-4-8, IEC61000-4-11) - Electromagnetic Immunity
- Power Quality:
- EN61000-3-2 (IEC61000-3-2) - Power Line Harmonics
- EN61000-3-3 (IEC61000-3-3) - Power Line Flicker
- EN 60950 (IEC 60950) - Product Safety
- Also approved under UL 1950, 3rd Edition/CSA C22.2 No. 950-95, Safety of Information Technology Equipment

Japanese Notice

ご使用になっている装置にVCCIマークが付いていましたら、次の説明文をお読み下さい。

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取扱説明書に従って正しい取り扱いをして下さい。

VCCIマークが付いていない場合には、次の点にご注意下さい。

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスA情報技術装置です　この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

BSMI Notice

警告使用者：這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

Harmonics Conformance (Japan)

高調波ガイドライン適合品

German Noise Declaration

Schalldruckpegel Lp = 70.0 dB (A)
Am Arbeitsplatz (operator position)
Normaler Betrieb (normal operation)

Nach ISO 7779:1988 / EN 27779:1991 (Typprüfung)

Electrostatic Discharge

To prevent damage to the system, be aware of the precautions you need to follow when setting up the system or handling parts. A discharge of static electricity from a finger or other conductor may damage system boards or other static-sensitive devices. This type of damage may reduce the life expectancy of the device.

To prevent electrostatic damage, observe the following precautions:

- Avoid hand contact by transporting and storing products in static-safe containers.
- Keep electrostatic-sensitive parts in their containers until they arrive at a static-free workstation.
- Place parts on a grounded surface before removing them from their containers.
- Avoid touching pins, leads, or circuitry.
- Always make sure you are properly grounded when touching a static-sensitive component or assembly.

Grounding Methods

There are several methods for grounding. Use one or more of the following methods when handling or installing electrostatic-sensitive parts:

- Use a wrist strap connected by a ground cord to a grounded workstation or computer chassis. Wrist straps are flexible straps with a minimum of one megohm +/- 10 percent resistance in the ground cords. To provide proper ground, wear the strap snug against the skin.
- Use heel straps, toe straps, or bootstraps at standing workstations. Wear the straps on both feet when standing on conductive floors or dissipating floor mats.
- Use conductive field service tools.
- Use a portable field service kit with a folding static-dissipating work mat.

If you do not have any of the suggested equipment for proper grounding, have an Authorized HP Reseller install the part.

Note: For more information on static electricity, or assistance with product installation, contact your Authorized HP Reseller.

Specifications

This section lists the environmental requirements of the Interface Manager card.

- Operating Environmental Requirements
  - Temperature: 0 to 50 ºC
  - Relative Humidity: 5% to 80% (non-condensing)
- Shipping and Storing Environmental Requirements
  - Temperature: -40 to +55 ºC
  - Relative Humidity: 0% to 92% (non-condensing)
- Power Requirements
  - VDC: 3.3V and 5V
  - 2.0A max
  - 15W maximum power dissipation
- Board Dimensions
  - Size: 15.72 cm × 16.18 cm (6.19 in × 6.37 in)
  - Height: 1.524 cm (0.60 in) max front surface
    1.524 mm (0.06 in) max rear surface
  - Thickness: 1.575 mm (0.062 in) max

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